

ABSTRACT OF THE DISCLOSURE

There is provided a semiconductor device manufacturing method which comprises the steps of forming a first insulating film over a silicon substrate (semiconductor substrate), forming a lower electrode, a dielectric film, and an upper electrode of a capacitor on the first insulating film, forming a first capacitor protection insulating film for covering at least the dielectric film and the upper electrode, forming a second capacitor protection insulating film, which covers the first capacitor protection insulating film, by a chemical vapor deposition method in a state that a bias voltage is not applied to the silicon substrate, and forming a second insulating film on the second capacitor protection insulating film by the chemical vapor deposition method in a state that the bias voltage is applied to the silicon substrate.